Is Participation in Competitive Sport During Older Adulthood Associated with Greater Life Satisfaction?

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A thesis submitted to the Faculty of Graduate Studies in

partial fulfillment of the requirements of the degree of

Master of Science

Graduate Program in Kinesiology and Health Science

York University

Toronto, Ontario

October 2016

Abstract

Based on previous work in the area arguing that the benefits accompanying competitive sport surpass those gained from exercise and physical activity alone (Dionigi, Baker, & Horton, 2011; Gayman, Fraser-Thomas, Dionigi, Horton, & Baker, in press), the following study explored the hypothesis that participation in competitive sport during older adulthood would be associated with greater levels of life satisfaction when compared to moderately active and sedentary age-matched peers. Measures of life satisfaction were evaluated in Canadian masters athletes aged 50 years and above and compared to normative data obtained from the Canadian Community Health Survey cycle 4.1. Results indicated that masters athletes did not report greater levels of life satisfaction for any of the outcomes measured. Cumulatively, the results of this study challenge the position that competitive sport is a valuable tool for enhancing life satisfaction during older adulthood.

Acknowledgements

I would like to thank first and foremost my supervisor Joseph Baker for all of his continuous guidance, encouragement and support throughout this process. Joe, thank you for always being kind, patient, understanding and knowledgeable. Most importantly, thank you for always maintaining such a calm and positive attitude, regardless of the situation. You are not only a fantastic supervisor but also a great friend and I am extremely grateful to have had the opportunity to be part of your team.

I would also like to extend my gratitude to all of my lab mates, especially Shruti Patelia and Rachael Stone, who from day one welcomed me with genuine smiles and open arms. Shruti, for always taking the time to assist me with the task at hand and for helping me discover answers to tough questions by putting our heads together. Rachael, the sarcastic joker who managed the daunting task of helping me make sense of our large datasets and numerous statistics problems, to aiding me with writing my proposal. Everything from lab work to being on the road collecting data, I couldn't imagine having done this without these lovely ladies, devoid of the daily dose of laughter and camaraderie.

I must also thank my sister Tala and her husband Mark for initially giving me the inspiration for my thesis project on life satisfaction. How suitable a topic coming from two very exemplary and content individuals, whom I've spent countless nights with discussing major topics on life including science, philosophy, psychology, politics and in general, on "what makes people happy".

Mom and dad, what can I say other than thank you for keeping me sane. For reminding me of why I am doing this in the first place, for always motivating me and giving me strength and perseverance when times get tough. You are my lifeline.

Lastly, I want to thank Dr. Rebecca Bassett-Gunter and Dr. Gary Turner who were my second pair of eyes when it came to my research, and who continuously provided me with such great feedback and critique.

This has no doubt been a gruelling but extremely fulfilling chapter in my life and I can say with certainty that it wouldn't have been made possible without the love and support of each and every one of you. Thank you.

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Introduction

Today, approximately 16% of the Canadian population is aged 65 and above, and due to longer life expectancy and declining fertility rates, the proportion of older adults is projected to steadily increase (Help Age International, 2013; Oeppen & Vaupel, 2002; Statistics Canada, 2015). Statistics Canada (2015) has estimated that the number of adults aged 65 and above now exceeds the number of children under the age of 15. Global demographic estimates project that this number will nearly double by the year 2050 (Help Age International, 2011; United Nations, Department of Economic and Social Affairs, 2013). This demographic shift has raised many concerns regarding available health care resources and the medical costs associated with older adults (Ramage-Morin, Shields, & Martel, 2010; Weir, Baker, & Horton, 2010). These statistics, in conjunction with the high prevalence of illness and chronic disease generally associated with the aging population (Kennedy, 1990), highlight the need for research focusing on activities leading to successful aging.

For many years, numerous studies have emphasized the importance of regular exercise and physical activity for healthy aging in older adults (Barry, 1986; Belza et al., 2004; Elkward & Larson, 1992; Heikkinen, 1998; Masseo et al., 2008; Nelson et al., 2007; Taylor et al., 2004; Warburton, Nicol, & Bredin, 2006). These studies argue that maintaining an active lifestyle during older adulthood can help prevent and sometimes revert many of the negative effects of aging on an individual's health and functional ability (Belza et al., 2004; Elkward & Larson, 1992; Heikkinen, 1998; Masseo et al., 2008; Nelson et al., 2007). In addition to increasing muscle capacity, involvement in regular physical activity has been found to help improve older adults' stamina, balance, joint mobility, agility, flexibility, walking speed and overall physical coordination (Belza et al., 2004; Bendall, Bassey, & Pearson, 1989; Buchner & Lateur, 1991;

Heikkinen, 1998; Masseo et al., 2008). Research has also indicated that exercise and physical activity carry favourable effects on metabolism, the regulation of blood pressure and the prevention of excessive weight gain that may arise with age (Belza et al., 2004; Berlin & Golditz, 1990; Heikkinen, 1998; Masseo et al., 2008; Nelson et al., 2007). Furthermore, epidemiological studies have suggested that exercise is associated with a decreased risk of osteoporosis, cardiovascular diseases, diabetes, as well as certain forms of cancer (Belza et al., 2004; Berlin & Golditz, 1190; Donahue, Abbott, & Reed, 1988; Heikkinen, 1998; Masseo et al., 2008; Nelson et al., 2007). Despite these findings, national data gathered from studies such as the Canadian Health Measures Survey (CHMS) continue to highlight the negative correlation between aging and physical activity levels (Dionigi, Baker, & Horton, 2011).

Interestingly, one subset of the aging population that continues to meet and surpass the national guidelines for physical activity is masters athletes. Masters athletes are characterized as adults generally over the age of 35 that exceed the minimum age specific to each sport but continue physical training and competition (Weir et al, 2010). These older athletes compete against others within a similar age group in a variety of sports at organized competitions taking place locally, nationally and internationally (Dionigi, 2008; Dionigi et al., 2011).

Despite the growing interest in masters athletics and sport participation in later life, very little research has been conducted on the value of competitive sport on the perceived overall health and wellbeing of older adults. This can largely be attributed to the novelty of adult sport (commonly referred to as masters sport) and the paucity of older athletes (Dionigi et al., 2011). Much of the available literature on older adults' physical activity participation has focused on the physiological and psychological outcomes associated with continuous involvement in non-competitive and low-to-moderate levels of exercise such as walking and dancing (Dionigi et al.,

2011). The abundance of research focusing on the benefits of activities of low-to-moderate intensity has helped strengthen the belief that older adults should avoid engaging in strenuous physical activity. However, there has not been any clear evidence to support this claim (Dionigi et al., 2011).

Conversely, many researchers have advocated competitive sport as an optimal type of activity for older adults (Dionigi et al., 2011; Hawkins, Wiswell, & Marcell, 2003). These researchers argue that masters athletes serve as the best example of successful aging for they often report greater levels of physical fitness (e.g., increased muscle mass and function) and are more likely to experience longer periods of health (such as absence of disease and disability) when compared with sedentary controls of the same age (Hawkins et al., 2003). A few recent studies, however, have suggested that masters athletes may only serve as role models for adults who are already physically active and that sedentary individuals of the same age group tended to find masters athletes intimidating, which in turn hindered their participation in physical activity and sport (Dionigi et al., 2011; Dionigi, Horton, Bellamy, & Baker, 2009; Horton, Baker, Cote, & Deakin, 2008).

Despite these findings, many researchers agree on the general health and fitness benefits associated with competitive sport such as improved mood, increased energy, increased cardiovascular function, reduced risk of arthritis, and type 2 diabetes, etc. (Hawkins et al., 2003; Warburton et al., 2006). Additionally, qualitative research suggests masters athletes experience unique benefits that exceed those gained from exercise and physical activity alone (Dionigi et al., 2011). Research conducted with masters athletes intimates that competitive sport involvement in older adulthood can (1) encourage team building and personal growth within an enhanced social network, (2) provide athletes with a sense of belonging and accomplishment, (3) establish ongoing

and long lasting friendships via weekly social interactions, (4) challenge traditional stereotypes of aging and decreased physical health, (5) offer opportunities to test personal abilities and beat others, (6) offer athletes the opportunity to travel and (7) aid in the management of an ageing identity (Dionigi et al., 2011; Gayman et al., in press).

Although researchers have studied the psychological benefits of sport participation in older adulthood, the majority of this work has been qualitative in nature. Much less work has focused on quantifying the psychological benefits associated with competitive sport participation amongst this population. This type of work, however, is important for understanding the generalizability of these findings at the population level. Therefore, quantitative work is crucial for developing a strong evidence base for interventions, especially since the prevalence of mental health decline and illness increases with age (Kennedy, 1990). Quantitative work addressing competitive sport and its contribution to older adults' mental health and wellbeing would be important and timely considering recent demographic shifts in population.

One reliable measure of wellbeing is life satisfaction (Diener, Suh, Lucas, & Smith, 1999; Luhmann, Hofmann, Eid, & Lucas, 2012; Sato, Jordan, & Funk, 2015), which refers to a subjective evaluation of one's life as a whole and serves as an important contributor to the broader constructs of mental and physical health (Diener, 1984; Maher, Pincus, & Ram, 2015; Murthy et al., 2001). Life satisfaction may also be a more accurate representation of overall health and wellbeing compared to quality of life, since it is less affected by external variables such as socioeconomic status and employment (Fonseca, Paul, & Martin, 2008). It is based on one's own cognitive judgments of the elements that they consider to be valuable rather than criteria that researchers deem to be important (Fonseca et al., 2008). Life satisfaction has also been shown to be a predictor of longevity and psychiatric morbidity and researchers have identified a dose-

response relationship between life dissatisfaction and all-cause disease, injury and mortality (Koivumaa-Honkanen et al., 2000). Moreover, increasing evidence suggests life satisfaction is linked to other important health predictors such as favourable self-reported health, social support and positive health behaviours (Kaprio, Koskenvuo, Langinvainio, Rita & Sarna, 1987; Koivumaa-Honkanen et al., 1996; Korkeila, Kaprio, Rissanen, Koshkenvuo & Sorensen, 1998; Mossey & Shapiro, 1982). Additionally, studies have shown a positive correlation between life satisfaction and mental health (Headey, Kelley, & Wearing, 1993; Schimmack, Oishi, Furr, & Funder, 2004; Tremblay, Blanchard, Pelletier, & Vallerand, 2006). Such studies argue that life satisfaction as well as mental and social wellbeing particularly benefit the health of the elderly as well as older adults in general (Gallo, Rabins, Lyketsos, Tien & Anthony, 1997; Huppert & Whittington, 1995) and thus, understanding the factors underpinning older adults' life satisfaction is important given the increase in mental health issues often associated with this population (World Health Organization, 2015; Kennedy, 1990).

Physical activity behaviours have, for many years, been positively correlated with life satisfaction (Penedo & Dahn, 2005; Rejeski & Mihalko, 2001). As adults progress into older adulthood, physical and cognitive capabilities typically decline, creating new barriers for goal pursuits. This can threaten an individual's sense of self and lead to decreased satisfaction with life (Gerstorf et al., 2010; Gwozdz & Sousa-Poza, 2010; Kunzmann, Little, & Smith, 2000; Maher, Aaron, & Ram, 2015; Smith, Borchelt, Maier, & Jopp, 2002). However, regular involvement in physical activity, through fitness and health adaptations, can delay the onset and progression of functional declines generally taking place during older adulthood (Keysor, 2003; Maher et al., 2015; Miller, Rejeski, Reboussin, Ten Have, & Ettinger, 2000; Paterson & Warburton, 2010). The maintenance of older adults' health (i.e. mental and physical) and fitness can contribute to feelings

of competence and independence that can allow them to pursue their personal goals and maintain a sense of identity. This, in turn, can lead to greater life satisfaction (Berg, Hassing, McClearn, & Johansson, 2006; Borg, Hallberg, & Blomqvist, 2006, Maher et al., 2015).

Cross sectional and prospective research conducted on the link between life satisfaction in older adulthood and physical activity has also found that those who reported greater levels of physical activity tended to experience higher levels of life satisfaction compared to less active and sedentary adults of the same age group (Courneya & Friedenreich, 1997, 1998; Elavski & McAuley, 2005). Furthermore, a study conducted by Jaclyn et al. (2015) concluded that physically active adults over the age of 65 reported greater life satisfaction on days when they partook in more physical activity than was usual to them. This study serves to highlight the within-person association between physical activity and life satisfaction. Cumulatively, these findings add to the existing evidence that physical activity is a valuable tool for enhancing life satisfaction in older adulthood.

Despite the growing body of knowledge supporting the positive link between physical activity and life satisfaction, little to no work has been devoted to examining the potential association between competitive sport participation and life satisfaction in older adults. Importantly, while life satisfaction research has focused primarily on adults, the majority of the work being conducted on competitive sport and its impact on life satisfaction has predominantly focused on youth. Such research, however, continues to highlight a positive correlation between sport participation and life satisfaction (Piko & Keresztes, 2006; Valois et al., 2004; Zullig & White, 2011). For example, in a study conducted by Zullig and White (2011) on the relationship between physical activity, sport participation and life satisfaction in middle school students, researchers found that life satisfaction was significantly reduced in both males and females who

reported not playing sports. Additionally, results revealed that males were 5 times more likely, and females 30 times more likely, to describe their health as fair or poor when they were not part of a sports team. Similarly, Ragheb and Griffith (1982) measured the interrelationships among leisure satisfaction, leisure participation and life satisfaction in the elderly and found that social, outdoor and sport activities had the strongest positive correlations with life satisfaction.

It may be speculated that individuals benefit from the positive social environment that sport offers, which might indirectly promote psychological health, wellbeing and life satisfaction (Graney, 1975; Zullig & White, 2011). For example, Graney (1975) and Neugarten, Havighurt and Tobin (1961) found that social activities and interactions were positively related to happiness, wellbeing and life satisfaction in older adults. However, in order for the activities to be considered satisfying, they had to maximize the use of an individuals' abilities, challenge them, interest them and be pleasurable (Susman, 1976). Research has also argued that participation in competitive sport may enhance social support and peer bonding among friends and teammates which may have a greater impact on life satisfaction than regular physical activity, which is often performed alone (Kirkcaldy, Shephard & Sienfen, 2002; McHale et al., 2005; Zullig & White, 2011). Moreover, participation in competitive sport has been shown to help promote self-respect, self-acceptance, a heightened self-concept, confidence, a positive perception of body image and a sense of self-worth (Ragheb & Griffith, 1982), all of which may potentially effect psychological wellbeing and, in turn, life satisfaction (Kirkcaldy, Shephard & Sienfen, 2002; McHale et al., 2005; Zullig & White, 2011).

The overall findings suggest that sport participation may be associated with improved life satisfaction in individuals, irrespective of their age. Although competitive sport participation appears to have the potential of contributing to this process, more investigations are needed to

better understand and explain this relationship.

Rationale for the Current Study

Based on previous work in this area suggesting the benefit accompanying sport tend to surpass those gained from exercise and physical activity alone (Dionigi et al., 2011; Gayman et al., in press), we hypothesized that participation in competitive sport during older adulthood would be associated with increased life satisfaction when compared to age-matched peers. Results from this study will further our understanding of the type and intensity of physical activity correlated with greater levels of life satisfaction.

Methods

Participants

Masters Athletes. Masters athletes were first recruited at various masters athletics competitions, meets and club practices taking place within the province of Ontario. Participation was voluntary and incentives (i.e., 1 bottle of Gatorade) were given to those who agreed to take part in the study (see Appendix A for a complete list of clubs and competitions attended). A computer-based version of the survey was also generated and voluntary invitations accompanied by a brief description of the study were sent out to all registered Canadian Masters Athletes via email. Athletes recruited for this study included any Canadian adult over the age of 50 who: (a) considered themselves to be a masters athlete and (b) continued to train regularly and partake in competitive sporting events dedicated to masters athletics taking place locally, nationally and/or internationally. A total of 103 masters athletes from across Canada participated in the study and demographic information for this group is shown in Table 1. All participants provided informed consent and this project received institutional ethics approval.

The masters athletes completed the Mastering Life Survey which contained questions extracted from the Canadian Community Health Survey (CCHS) cycle 4.1 (collected 2009 and 2010) pertaining to their satisfaction with various aspects of their life, as well as their sport and physical activity behaviours. Questions regarding their age, sex, marital status and total household income were also collected and used as covariates in the statistical analyses.

Normative Data. Normative data were drawn from age-matched groups from the CCHS cycle 4.1. The CCHS consists of a cross-sectional questionnaire developed in 1991 by three Canadian government organizations including Health Canada, Statistics Canada and the Canadian Institute for Health Information. The CCHS assesses information related to Canadians' health status (e.g., presence or absence of disease or condition) and health care utilizations, lifestyle and social conditions, as well as other variables including satisfaction with life, mental health and overall wellbeing. The CCHS also gathers information regarding Canadians' sport and physical activity participation. Data collected from this survey are primarily used by federal and provincial departments of health and human resources as well as multiple government agencies for health surveillance and population health research aimed at improving the health of Canadians. Voluntary participants aged 12 and above living in all Canadian provinces and territories were randomly selected and asked via telephone to partake in the survey. Persons living on Indian Reserves and on Crown Lands, institutional residents, full-time members of the Canadian Forces and residents of certain remote regions were excluded from the survey. The CCHS cycle 4.1 had a sample size of 131,486 and represented approximately 98% of the Canadian population aged 12 and above. Participants completed the questionnaire through computer-assisted interviews, over the telephone or by their personal computers (Statistics Canada, 2015). The CCHS has been recognized for having a very high nation wide response rate (~85% for cycle 4.1), and for being a

useful data source for emerging health issues in Canada (Statistics Canada, 2011).

The present analysis was restricted to CCHS respondents aged 50 years or above who had data for the variables of interest including satisfaction with life (measured by the Satisfaction With Life Scale, see below), physical activity index (active, moderately active or sedentary), age, sex, marital status, and total household income. Of the 131,486 CCHS cycle 4.1 respondents, 120,886 (91.94%) were excluded from the analysis due to invalid or missing data for the variables of interest. The most common reasons for exclusion included respondents being under the age of 50 years, being categorized as active based on the physical activity index (i.e., only moderately active and sedentary participants were included in the present analysis), not disclosing information regarding their physical activity behaviours, age, sex, marital status or total household income, as well as failing to complete the Life Satisfaction Scale, which was optional content selected by health regions in Quebec, Alberta and Nunavut.

The remaining 10,600 CCHS respondents were divided into the *moderately active* or *sedentary* groups based on their physical activity index. Physical activity information was collected and analyzed using a modified version of the Minnesota Leisure-time Physical Activity Questionnaire used in the CCHS cycles 4.1. Respondents were asked if they had participated in any of the following activities during their leisure time in the past 3 months: walking for exercise, gardening or yard work, swimming, bicycling, popular or social dance, home exercises, ice hockey, ice skating, in-line skating or rollerblading, jogging or running, golfing, exercise class or aerobics, downhill skiing or snowboarding, bowling, baseball or softball, tennis, weight-training, fishing, volleyball, basketball, soccer and any additional physical activities not specified. They were then asked to indicate the number of times they partook in the activity per week and the average duration of each session in minutes per bout. A metabolic equivalency (MET) value was

then calculated for each activity in order to determine an energy expenditure value (EEV) expressed in kilocalories per kilogram of body weight per day (kcal/kg/day; see Ainsworth et al., 2000; Ainsworth et al., 2011). These values were used to create physical activity indices, two of which *sedentary* (<1.5 kcal/kg/day) and *moderately active* (1.5-2.99 kcal/kg/day, which is equivalent to walking approximately 30 minutes per day) were used as normative data for this investigation[1]. Final samples sizes for these two groups were 3,323 and 7,277, respectively. Demographic statistics of the moderately active and sedentary CCHS cycle 4.1 respondents included in the present study are shown in Table 1.

Study Outcomes

Satisfaction with Life Scale (SWLS). Satisfaction with Life was measured using 6 questions.

- How satisfied are you with yourself?
- How satisfied are you with you leisure activities?
- How satisfied are you with your financial situation?
- How satisfied are you with the way your body looks?
- How satisfied are you with your relationships with family members?
- How satisfied are you with your relationships with friends?

These questions were also used in the *Mastering Life Survey* to assess the same outcomes in masters athletes. All respondents chose from response options on a 5-point Likert scale: 'Very Satisfied' (score of 5), 'Satisfied', 'Neither satisfied nor dissatisfied', 'Dissatisfied' or 'Very Dissatisfied' (score of 1). Additionally, summing the participants' individual scores to each of the

[1] The CCHS physical activity index also included an 'active' group. This was not used in the current study because it was deemed to likely share too many variables with the masters athlete group (e.g., physical activity behaviours, participation in competitive sport, SES, etc.).

life satisfaction questions generated a 'Summative Life Satisfaction Score', which was also included in the analyses.

The six individual items presented in the SWLS were treated as separate outcomes in the current study in order to identify what particular aspects of life satisfaction (i.e. self, leisure activities, financial situation, etc.) served as the greatest contributors to variations in summative life satisfaction scores obtained between the groups. The Satisfaction with Life Scale was shown to have favourable psychometric properties, including high internal consistency (or reliability), as determined by a Chronbach's alpha of 0.728 for the complete sample (i.e. masters athletes, moderately active and sedentary adults included) and an alpha of 0.918 for the masters athletes alone.

Data Analysis Plan

In order to determine whether differences in life satisfaction scores existed among the three groups (i.e. masters athletes, moderately active and sedentary adults), a series of univariate analyses of variance (ANOVA) were employed. The test for normality, examining standardized skewness and the Shapiro-Wilks test indicated that the life satisfaction data were statistically non-normal ($p<0.001$). The Levene's F test further revealed that the homogeneity of variance assumption was not met for all of the life satisfaction outcomes included within the analysis ($p<0.001$; see Table 4). As such, a one-way ANOVA using *Welch's F* test (which is robust to both non-normality and unequal variances) was conducted on the summative life satisfaction scores as well as on the individual life satisfaction outcomes to detect significant differences between the three groups without inflating the Type I error rate.

Post hoc comparisons, using the Games-Howell post hoc procedure were conducted to

determine which groups differed significantly. Alpha was adjusted using Bonferroni's correction and as a result, an alpha of .007 was used for all subsequent analyses. All analyses were conducted using SPSS v23.[2]

Results

Descriptive Statistics

A large proportion of masters athletes fell within the age categories of 50-54 (24.3%) and 55-59 (24.3%) years, whereas the majority of moderately active and sedentary CCHS respondents were aged between 55-59 (21.2%) and 50-54 (20.3%) years, respectively. With regard to marital status, a higher proportion of masters athletes (36.9%) reported being 'single, and never married' compared to both the moderately active (10.5%) and sedentary (10.4%) groups. Additionally, the masters athletes group had the smallest proportion of widowed, separated or divorced individuals (15.5%) versus the moderately active (31.0%) and sedentary (36.3%) groups. Furthermore, a large majority of masters athletes (67.0%) stated earning a total household income of $80,000 or more, whereas the majority of both the moderately active and sedentary non-athlete groups reported earning a total household income of $60,000 or less (64.8% and 72.4%, respectively). Detailed demographic statistics for the masters athletes, moderately active and sedentary adult groups can be found in Table 1.

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[2] Parallel analyses were conducted using multivariate analysis of covariance (MANCOVA) while controlling for the effects of important covariates including age, sex, marital status and total household income. These covariates were selected based on previous research arguing them to be consistently associated with life satisfaction (Berg et al., 2006; Edwards & Klemmack, 1973; Fugl-Meyer, Melin & Fugl-Meyer, 2002; Myers & Diener, 1995; Spreitzer & Snyder, 1974; Strine, Chapman, Balluz, Moriarty & Mokdad, 2008). Results from these analyses were largely in agreement except for small differences in satisfaction with self, financial situation and summative life satisfaction scores (see Appendix B and C). These findings, however, were not included in the main analysis given that the data were non-normal and violated the assumption of equal variance.

Summative Life Satisfaction

Results from the one-way ANOVA conducted on the summative life satisfaction scores revealed a statistically significant main effect, *Welch's F* (2, 270.233) = 168.276, $p<0.001$, indicating that the three groups differed on their summative life satisfaction scores. The estimated omega squared ($\omega^2 = 0.034$) indicated that approximately 3.4% of the total variance in summative life satisfaction scores was attributable to differences in grouping variable.

Post hoc comparisons (see Table 3) indicated that the moderately active group had a significantly greater summative life satisfaction score than the sedentary adult group. No significant differences were found between the masters athletes and the moderately active or sedentary adult groups (see Table 2 for means and standard deviations).

Individual Life Satisfaction Outcomes

Separate ANOVAs were conducted to determine whether statistically significant differences existed between the masters athletes, moderately active and sedentary adult groups for each of the six life satisfaction outcomes included within the current study. Results revealed statistically significant main effects ($p<0.001$), indicating that all three groups differed with respect to their mean scores for each outcome. Post hoc comparisons (see Table 3) indicated that the masters athletes and moderately active adults reported significantly greater satisfaction with leisure activities and with body looks than the sedentary adults. However, only the moderately active group reported significantly greater satisfaction with self and satisfaction with financial situation than the sedentary group. Furthermore, for satisfaction with relationships with family and satisfaction with relationships with friends, there were significant differences between all three groups. The masters athlete group reported the lowest scores on these outcomes, followed by

the sedentary group and the moderately active group. No other between-group differences were found.

Discussion and Implications

Recently, a growing number of studies have advocated the potential benefits of competitive sport participation for healthy development and successful aging in later life (Dionigi, 2008; Dionigi et al., 2011; Hawkins et al., 2003). More specifically, given the surge in retiring baby boomers (Help Age International, 2013; Oeppen & Vaupel, 2002; Statistics Canada, 2015), in conjunction with the poor health generally associated with this population (Kennedy, 1990; Sheppard et al., 2003), masters sport is now being promoted to older adults as a means to maintain their overall health, functioning, and wellbeing (Dionigi, 2008; Grant, 2001; Hawkins et al., 2003). Despite the growing interest in masters sport in western societies and masters sport research (Dionigi, 2008; Weir, 2010), very little quantitative work has examined the potential health benefits that may be associated with competitive sport participation during older adulthood. Moreover, even fewer studies have quantitatively explored whether the psychological health benefits of organized sport, specifically pertaining to older adults' subjective wellbeing and life satisfaction go beyond those derived from other forms of exercise and physical activity.

Therefore, the purpose of this quantitative study was to determine whether Canadian masters athletes experienced greater levels of life satisfaction compared to moderately active and sedentary age-matched peers. Life satisfaction outcomes (i.e. overall satisfaction, satisfaction with self, leisure activities, financial situation, body looks, relationships with family and relationships with friends) were measured in Canadian masters athletes aged 50 years and above and compared to normative data obtained from the Canadian Community Health Survey cycle 4.1.

Results revealed that masters athletes reported significantly greater satisfaction with leisure activities and satisfaction with body looks than the sedentary adult group but that they did not score significantly greater than the moderately active group for any of the outcomes measured. These findings contradicted our initial hypothesis that participation in competitive sport during older adulthood would be associated with the greatest levels of life satisfaction. Furthermore, post-hoc comparisons for satisfaction with relationships with family and friends indicated that masters athletes reported the lowest scores on these outcomes, followed by the sedentary group and the moderately active group. This was surprising given the distinct social nature of sport as well as the numerous studies promoting masters sport as a means to build and enhance social relationships (Dionigi et al., 2011; Hodge, Allen, & Smellie, 2008). For instance, Dionigi et al., (2011) mentioned that the competitive structure of masters sport and its club system allowed for the establishment of ongoing friendships and weekly social interactions between athletes, and that the friendships formed gave the athletes a sense of belonging which encouraged ongoing participation.

It may also be speculated that masters athletes consist of a unique group who do not fit typical models of physical activity and life satisfaction. In comparison to moderately active adults who generally engage in physical activity for its health benefits, masters athletes may be placing too much emphasis on competition and may be too concerned with winning and beating records (Wilson, Sullivan, Myers, & Feltz, 2004). It is possible this strong emphasis on extrinsic rewards and social comparison negatively affects life satisfaction, perhaps by increasing their expectations, and reducing the likelihood of feeling satisfied with their performance and/or other aspects of their life (Flett & Hewitt, 2005; Frost & Henderson, 1991; Hewitt & Flett, 1990; Koivula, Hassmen, & Fallby, 2002; Stoeber et al., 2007; Terry-Short et al., 1995).

There has also been a growing body of research suggesting that the dose-response relationships between physical activity and health outcomes may not be as linear as previously believed. For example, researchers have mentioned concerns regarding excessive aerobic training in older age, which has been associated with negative consequences such as immune system dysfunction, overuse injuries and exercise abuse (Calogero & Pedrotty, 2004; Davis, 2000; Jones, Cowan, & Knapik, 1994; Shephard, Roy, & Pang, 1994). Although many masters athletes may be pursuing competitive sport because of a desire to maintain a healthy and active lifestyle, some may be obsessed with physical training and feel pressure to train excessively and compete in order to overcome or resist the aging process (Baker, Fraser-Thomas, Dionigi, & Horton, 2010). However, given the eventual decline of one's health over time and the disability that is commonly associated with aging, maintaining an extremely active lifestyle may not be an indication of successful aging and could become problematic for an aging identity (Baker et al., 2010). Moreover, masters athletes who become obsessed with training 'because they have to' (in order to age successfully) may hold unrealistically high standards and feel pressure to maintain a certain level of fitness and ability. This pressure to look and feel a certain way could lead to a life fuelled by anxiety and a fear of failure and can enable the athlete to never feel satisfied with their actions, on and off the field (Flett & Hewitt, 2005; Frost & Henderson, 1991; Hewitt & Flett, 1990; Koivula, Hassmen, & Fallby, 2002; Stoeber et al., 2007; Terry-Short et al., 1995). Given these findings, the potential negative experiences and outcomes of competitive sport participation in relation to its effects on life satisfaction during older adulthood need further examination.

Conversely, our results suggest that adults aged 50 years and above partaking in moderate levels of physical activity (equivalent to 30 minutes of brisk walking a day) may be reaping the greatest rewards with regards to life satisfaction. Although surprising, these results echo the work

of Wicker and Frich (2015) who found that moderate levels of physical activity had significant and positive effects on an individual's subjective wellbeing (SWB), while participation in activities of high-intensity had a significant and negative impact. Together, these findings, in conjunction with the high prevalence of mental illness and other diseases generally associated with the aging population (Kennedy, 1990), highlight the need for additional research in this area.

Overall, our results are evidence that involvement in different forms of sport and physical activity (e.g. competitive vs. recreational) in later life may affect correlates of life satisfaction differently. More importantly, these findings illustrate that participation in competitive sport during later life may not be as ubiquitously positive as others (e.g., Hawkins et al., 2003) have suggested, at least with regard to enhancing certain measures of an individual's life satisfaction.

Although these findings contradicted our initial hypothesis, it is important to keep in mind that only a small percentage of the variation in life satisfaction scores could be accounted for by physical activity behaviour. This may be a result of the complex nature of life satisfaction, which is dependent upon a long list of variables that an individual deems to be important (Fonseca, Paul, & Martin, 2008).

Practical Implications and Directions for Future Work

The findings of this study may have practical implications for public health policy. Although requiring replication, our results illustrate that when the aim is to enhance life satisfaction amongst older adults, recommendations should stress the importance of continuous involvement in moderate levels of physical activity and exercise. Although organized sport may be beneficial for improving certain dimensions of health (e.g., physical) in this population (Dionigi et al., 2011; Hawkins et al., 2003), our results have shown that this form of activity may

not be an effective means for further enhancing measures of life satisfaction.

Given these intriguing results, future research in this area should consider the value of interventions centered on the promotion of moderate physical activity versus competitive sport. Such interventions may help bring awareness and inform the aging population that continuous involvement in moderate levels of physical activity might be sufficient in order to reap the benefits with regards to life satisfaction. Sport scientists may also choose to explore whether a relationship exists between exercise intensity and life satisfaction during older adulthood. Furthermore, this relationship should also be examined in terms of an exercise intensity threshold at which life satisfaction begins to decrease. Perhaps more importantly, researchers should identify what specific elements of masters sport (e.g. a strong emphasis on competition, winning, and social comparison) affect the various levels of life satisfaction. Moreover, it is paramount that researchers in this area focus on exploring how the various components of life satisfaction change and evolve throughout the lifespan. Identifying the predictors of these changes may be critical for understanding how to maximize the overall health and wellbeing of older adults. Finally, future work should investigate whether the personality makeup of masters athletes differs from that of the general population and if so, whether those differences play a role in the life satisfaction scores obtained in this study.

Strengths and Limitations of the Current Study

This study adds to a very limited evidence base on the relationships between sport participation and life satisfaction during older adulthood. There were several strengths to this investigation including the use of relatively large samples for all of the three groups, statistically controlling for significant covariates such as age, sex, marital status, and total household income

and the ability to compare reports from a group where there is strong interest (i.e., masters athletes) to population norms. However, despite these strengths there were several limitations. First, the cross-sectional design meant that life satisfaction outcomes could not be directly attributed to involvement in masters sport. In future research, it would be interesting to examine the relationships between different participation types and intensities and their effects on life satisfaction over time. Because completion of the survey was voluntary, it is also possible that there could have been a bias due to participants willing to answer the survey having higher levels of life satisfaction than those who declined participation. Further, given that the CCHS did not include a temporal component embedded within it's questions such as "over the last 3 months…" responses to the life satisfaction question may have been influenced by short-term contextual factors experienced by the respondents at the time that the survey was administered. Such contextual factors may have predominantly affected the masters athletes since many had completed the Mastering Life Survey moments following a competition and could have been heavily influenced by their performance.

Additionally, a large majority of the masters athletes participating in this study consisted of track and field athletes living within the province of Ontario and thus may not be representative of Canadian masters athletes as a whole. Moreover, the current study focused on master athletes who were generally affluent, highly educated, and predominantly Caucasian (Wright & Perricelli, 2008). Finally, the study was limited to the available variables and data included in the CCHS. It is important to note that the satisfaction with life scale was optional content selected by health regions in Quebec, Alberta, and Nunavut.[3] This could affect the generalizability of our findings, as residents of these provinces may not be representative of all Canadians aged 50 years and

[3] Based on the limited provinces from across Canada, differences between provinces were considered. No differences were found.

above.

Concluding Thoughts

In conclusion, this study is the first to quantitatively examine the relationships between competitive sport participation and life satisfaction in Canadian masters athletes aged 50 and above. While these results require replication and extension, they provide a reasonable 'first-step' to further investigations in this area. Together, the results gathered from this study contradict previous literature arguing that sport involvement is a valuable venue for promoting successful aging in older adults and/or suggest that this outcome is much more nuanced than previously conceptualized.

Table 1: Demographic Statistics of Masters Athletes, Moderately Active and Sedentary Groups Aged 50+ Including Age, Sex, Marital Status and Total Household Income

Demographic	Group; no. (%) of individuals		
	Master Athletes	Moderately Active	Sedentary
N	103	3323	7277
Age			
50 to 54 years	25 (24.3)	702 (21.1)	1476 (20.3)
55 to 59 years	25 (24.3)	704 (21.2)	1424 (19.6)
60 to 64 years	19 (18.4)	605 (18.2)	1193 (16.4)
65 to 69 years	14 (13.6)	476 (14.3)	880 (12.1)
70 to 74 years	6 (5.8)	382 (11.5)	763 (10.5)
75 to 79 years	9 (8.7)	267 (8.0)	747 (10.3)
80 years or more	5 (4.9)	187 (5.6)	794 (10.9)
Sex			
Male	69 (67.0)	1498 (45.1)	2997 (41.2)
Female	34 (33.0)	1825 (54.9)	4280 (58.8)
Marital Status			
Married or Common Law	49 (47.6)	1944 (58.5)	3876 (53.3)
Widowed/Separated/Divorced	16 (15.5)	1029 (31.0)	2643 (36.3)
Single, never married	38 (36.9)	350 (10.5)	758 (10.4)
Total Household Income			
$60,000 or less	24 (23.3)	2154 (64.8)	5270 (72.4)
$60,000 to $80,000	10 (9.7)	470 (14.1)	803 (11.0)
$80,000 or more	69 (67.0)	699 (21.0)	1204 (16.5)

Table 2: Means and Standard Deviations of Life Satisfaction Outcomes by Group		
Outcome	Mean	Standard Deviation
Satisfaction with Self		
Masters Athletes	4.15	0.974
Moderately Active	4.29	0.660
Sedentary	4.13	0.728
Satisfaction with Leisure Activities		
Masters Athletes	4.2	0.922
Moderately Active	4.22	0.792
Sedentary	3.81	0.999
Satisfaction with Financial Situation		
Masters Athletes	3.83	1.030
Moderately Active	4	0.847
Sedentary	3.82	0.945
Satisfaction with Body Looks		
Masters Athletes	4.03	1.033
Moderately Active	3.91	0.821
Sedentary	3.69	0.926
Satisfaction with Relationships with Family		
Masters Athletes	4.06	0.998
Moderately Active	4.45	0.691
Sedentary	4.37	0.748
Satisfaction with Relationships with Friends		
Masters Athletes	4.13	0.925
Moderately Active	4.47	0.591
Sedentary	4.36	0.658
Summative Life Satisfaction		
Masters Athletes	24.4	4.957
Moderately Active	25.3	2.867
Sedentary	24.2	3.254

Table 3: Welch's F, Degrees of Freedom and Games-Howell Post Hoc Results by Life Satisfaction Outcome

Outcome	Welch's Statistic (F)¶	df	df2	p-value	Pairwise Comparison§
Satisfaction with Self	57.970	2	270.782	0.000	M > S
Satisfaction with Leisure Activities	256.685	2	273.633	0.000	A, M > S
Satisfaction with Financial Situation	48.320	2	272.147	0.000	M > S
Satisfaction with Body Looks	77.704	2	271.977	0.000	A, M > S
Satisfaction with Relationship with Family	19.760	2	270.759	0.000	M > A, S; A < S
Satisfaction with Relationship with Friends	42.559	2	270.546	0.000	M > A, S; A < S
Summative Life Satisfaction Score	168.276	2	270.233	0.000	M > S

Notes:

¶ = Asymptotically F distributed

§ = Pairwise Comparison using Games-Howell post-hoc test at $p < 0.007$

A = Master Athlete Group

M = Moderately Active Adult Group

S = Sedentary Adult Group

> = Significantly greater than

< = Significantly less than

Table 4: Levene Statistic, Degrees of Freedom and Significance by Life Satisfaction Outcome				
	Levene Statistic	df1	df2	Significance
Satisfaction with Self	20.588	2	10700	0.000
Satisfaction with Leisure Activities	65.671	2	10700	0.000
Satisfaction with Financial Situation	72.644	2	10700	0.000
Satisfaction with Body Looks	105.948	2	10700	0.000
Satisfaction with Relationships with Family	9.800	2	10700	0.000
Satisfaction with Relationships with Friends	8.098	2	10700	0.000
Summative Life Satisfaction Score	25.427	2	10700	0.000

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Appendix A – Masters Athletics Competitions and Sporting Events Attended

Competitions

Taylor Creek 5K Cross Country (September 25th 2015)

Don Farquharson Harriers 4K (October 2nd 2015)

Sunnybrook Park 8K (October 16th 2015)

Ontario Cross Country Championships (November 13th 2015)

Canadian Cross Country Championships (November 26th 2015)

Clubs

New Market Huskies

University of Toronto Track

Longboat Road Runners

Black Lungs Toronto

Appendix B – Multivariate Analysis of Covariance (MANCOVA) Results

Table 1: Multivariate Analysis of Covariance (MANCOVA) Post Hoc Results

	Value	F	Hypothesis df	Error df	Significance	Partial Eta Squared
Pillai's trace	0.050	45.483	12.000	21384.000	0.000	0.025
Wilks' lambda	0.950	45.860	12.000	21382.000	0.000	0.025
Hotelling's trace	0.052	46.238	12.000	21380.000	0.000	0.025
Roy's largest root	0.047	83.615	6.000	10692.000	0.000	0.045

Table 2: Multivariate Analysis of Covariance (MANCOVA) Pairwise Comparisons, Standard Error and Significance by Life Satisfaction Outcome

Outcome	Standard Error	Significance	Pairwise Comparison[§]
Satisfaction with Self	0.071	0.045	M > A
	0.015	0.000	M > S
Satisfaction with Leisure Activities	0.093	0.000	A > S
	0.020	0.000	M > S
Satisfaction with Financial Situation	0.089	0.000	M > A
	0.018	0.000	M > S
Satisfaction with Body Looks	0.088	0.001	A > S
	0.019	0.000	M > S
Satisfaction with Relationships with Fam	0.073	0.000	M > A
	0.015	0.000	M > S
	0.073	0.000	S > A
Satisfaction with Relationships with Friends	0.064	0.000	M > A
	0.013	0.000	M > S
	0.064	0.002	S > A
Summative Life Satisfaction Score	0.313	0.001	M > A
	0.065	0.000	M > S

Notes:

§ = Pairwise Comparison significant at the $p < 0.05$

A = Masters Athlete Group

M = Moderately Active Group

S = Sedentary Group

> = Significantly greater than

Appendix C – Covariate Significance and Effect Sizes (%) by Life Satisfaction Outcome

Table 1: Covariate Significance and Effect Sizes (%) by Life Satisfaction Outcome

Outcome	Covariate	Significance	Effect Size (%)
Satisfaction with Self			
	Age	0.000*	0.194
	Sex	0.510	0.004
	Marital Status	0.000*	0.292
	Total Household Income	0.000*	0.436
	Physical Activity Level	0.000*	0.900
Satisfaction with Leisure Activities			
	Age	0.000*	1.416
	Sex	0.737	0.001
	Marital Status	0.000*	0.325
	Total Household Income	0.000*	0.384
	Physical Activity Level	0.000*	4.000
Satisfaction with Financial Situation			
	Age	0.000*	3.168
	Sex	0.383	0.006
	Marital Status	0.000*	0.740
	Total Household Income	0.000*	4.494
	Physical Activity Level	0.000*	0.800
Satisfaction with Body Looks			
	Age	0.000*	0.865
	Sex	0.000*	2.465
	Marital Status	0.076	0.029
	Total Household Income	0.875	0.000
	Physical Activity Level	0.000*	1.400
Satisfaction with Relationships with Family			
	Age	0.000*	1.166
	Sex	0.000*	0.533
	Marital Status	0.000*	0.563
	Total Household Income	0.000*	0.250
	Physical Activity Level	0.000*	0.500
Satisfaction with Relationships with Friends			
	Age	0.000*	0.212
	Sex	0.000*	0.593
	Marital Status	0.000*	0.303
	Total Household Income	0.000*	0.185
	Physical Activity Level	0.000*	0.800

Appendix D – Pearson Correlation Coefficients

Table 1: Significant Pearson Correlation Coefficients Between Life Satisfaction Outcomes in Masters Athletes

		Satisfaction with Self	Satisfaction with Leisure Activities	Satisfaction with Financial Situation	Satisfaction with Body Looks	Satisfaction with Relationships with Family	Satisfaction with Relationships with Friends
Satisfaction with Self	Pearson Correlation	1	.741**	.669**	.726**	.667**	.708**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	103	103	103	103	103	103
Satisfaction with Leisure Activities	Pearson Correlation	.741**	1	.635**	.704**	.637**	.705**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	103	103	103	103	103	103
Satisfaction with Financial Situation	Pearson Correlation	.669**	.635**	1	.576**	.534**	.578**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	103	103	103	103	103	103
Satisfaction with Body Looks	Pearson Correlation	.726**	.704**	.576**	1	.645**	.591**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	N	103	103	103	103	103	103
Satisfaction with Relationships with Family	Pearson Correlation	.667**	.637**	.534**	.645**	1	.692**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	103	103	103	103	103	103
Satisfaction with Relationships with Friends	Pearson Correlation	.708**	.705**	.578**	.591**	.692**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	103	103	103	103	103	103

Notes: **. Correlation is significant at the 0.01 level (2-tailed).

Appendix E – Mastering Life Survey

YORK UNIVERSITY MASTERS ATHLETE SURVEY

Background Information

Please indicate your date of birth (month/day/year)? __/__/____

Many people sometimes feel older or younger than their actual age. What age do you feel at the moment? _____ years

Please indicate your sex:

- ☐ Male
- ☐ Female

What is your current marital status?

- ☐ Single, never married
- ☐ Married or domestic partnership
- ☐ Divorced/Separated
- ☐ Widowed

How tall are you? *(Please answer in feet and inches i.e. 5 foot 3 inches)*

_____

How much do you weigh? *(in lbs)* _____

What is the highest degree, certificate or diploma you have ever obtained?

- ☐ No post-secondary degree, certificate or diploma
- ☐ Trade certificate or diploma from a vocational school or apprenticeship training
- ☐ Non-university certificate or diploma from a community college, CEGEP, school of nursing, etc.
- ☐ University certificate below bachelor level
- ☐ Bachelor degree
- ☐ University degree or certificate above bachelor's degree

Please select your total household income from all sources:

- ☐ Less than $50,000
- ☐ $50,000 to less than $60,000
- ☐ $60,000 to less than $80,000
- ☐ $80,000 to less than $100,000
- ☐ $100,000 or more

Do you consider yourself a "Master Athlete" within the sport you are participating in today?

☐Yes ☐No

How many years have you been competing in this Master sport? _____ years

How many hours a week do you dedicate to practicing for this sport? _____hours/week

Why do you participate in Master athletics? *(Select all that apply)***?**

- □ Fun
- □ Helps relieve stress
- □ To see friends
- □ Enjoy competition/competitive spirit
- □ Because of habit
- □ Other – Please specify: _____

In general, would you say your health is?

□Excellent □Very good □Good □Fair □Poor

In general, would you say your mental health is?

□Excellent □Very good □Good □Fair □Poor

Thinking about the amount of stress in your life, would you say that most days are:

- □ Not at all stressful
- □ Not very stressful
- □ A bit stressful
- □ Quite a bit stressful
- □ Extremely stressful

How would you describe your sense of belonging to your local community?

□Very strong □Somewhat strong □Somewhat weak □Very weak

Are you a member of any volunteer organizations or associations such as school groups, church social groups, community centers, ethnic associations or social, civic or fraternal clubs?

□ Yes □No

If "yes", please indicate how often you participated in meetings or activities with these groups in the past 12 months. If you belong to multiple, just think of the ones in which you were most active.

- □ At least once a week
- □ At least once a month
- □ At least 3 or 4 times a year
- □ At least once a year
- □ Not at all

How long do you usually spend sleeping each night?

- □ Under 2 hours
- □ 2 hours to less than 3 hours
- □ 3 hours to less than 4 hours
- □ 4 hours to less than 5 hours

- ☐ 5 hours to less than 6 hours
- ☐ 6 hours to less than 7 hours
- ☐ 7 hours to less than 8 hours
- ☐ 8 hours to less than 9 hours
- ☐ 9 hours to less than 10 hours
- ☐ 10 hours to less than 11 hours
- ☐ 11 hours to less than 12 hours
- ☐ 12 hours or more

In the past 12 months have you seen, or spoken to your family doctor or general practitioner about your physical, emotional or mental health?

- ☐ Yes - If yes, how many times in the past 12 months? _____
- ☐ No
- ☐ Refuse to answer

In the past 4 weeks, did you take any vitamin or mineral supplements?

- ☐ Yes - If yes, on how many days did you take them? _____
- ☐ No

Have you done any of the following activities in the past 3 months? (Check all that apply)

**For those you have selected, please specify how many times you participated in the activity within the 3 months, and for how long (in minutes) you typically spent doing each activity*

- ☐ Walking for exercise _____ times/week _____minutes/bout
- ☐ Gardening or yard work _____ times/week _____minutes/bout
- ☐ Swimming _____ times/week _____minutes/bout
- ☐ Bicycling _____ times/week _____minutes/bout
- ☐ Home exercises _____ times/week _____minutes/bout
- ☐ Ice hockey _____ times/week _____minutes/bout
- ☐ Ice skating _____ times/week _____minutes/bout
- ☐ In-line skating or Rollerblading _____ times/week _____minutes/bout
- ☐ Jogging or running _____ times/week _____minutes/bout
- ☐ Golfing _____ times/week _____minutes/bout
- ☐ Exercise class or Aerobics _____ times/week _____minutes/bout
- ☐ Downhill skiing or snowboarding _____ times/week _____minutes/bout
- ☐ Baseball or softball _____ times/week _____minutes/bout
- ☐ Tennis _____ times/week _____minutes/bout

- ☐ Weight-training _____ times/week
  _____minutes/bout
- ☐ Volleyball _____ times/week
  _____minutes/bout
- ☐ Basketball _____ times/week
  _____minutes/bout
- ☐ Soccer _____ times/week
  _____minutes/bout
- ☐ Any other - Please specify: _____
- ☐ No physical activity

In a typical week during the past 3 months, how much time did you usually spend:

(Check all the apply – For those selected, please specify the number of hours per week)

- ☐ On a computer, playing computer games, and using the internet ____hours/week
- ☐ Watching television or videos ____hours/week
- ☐ Reading ____hours/week

The following questions pertain to injuries and chronic diseases in the past 12 months, which may have limited your normal functioning. If you did not experience any injuries or chronic diseases of that nature during that time, please feel free to skip this section

In the past 12 months, which type of injury limited your normal function? *(Please check all that apply and indicate if the injury occurred more than once)*

- ☐ Multiple injuries _____ times
- ☐ Broken or fractured bones _____ times
- ☐ Burn, scald, chemical burn _____ times
- ☐ Dislocation _____ times
- ☐ Sprain or strain (including repetitive strain) _____ times
- ☐ Cut, puncture, animal or human bite (open wound) _____ times
- ☐ Scrape, bruise, blister _____ times
- ☐ Concussion or other brain injury _____ times
- ☐ Poisoning _____ times
- ☐ Injury to internal organs _____ times
- ☐ Other – Specify: _____

Did any of the injuries you reported above cause you to limit training or competition in your sport? *(If yes, can you specify the injury)* _____

What type of activity were you doing when you got injured? *(Check all that apply)*

- ☐ Sports or physical exercise (include school activities)
- ☐ Leisure or hobby (include volunteering)
- ☐ Working at a job or business (exclude travel to or from work)
- ☐ Travel to or from work

- ☐ Household chores, other unpaid work or education
- ☐ Sleeping, eating, personal care
- ☐ Other – Specify

Was the injury the result of a fall? ☐Yes ☐No

In the past 12 months were you diagnosed by a health professional with a type of chronic condition? *(Please check all that apply)*

- ☐ Asthma
- ☐ Arthritis
- ☐ Back problems
- ☐ High blood pressure
- ☐ Migraine headaches
- ☐ Chronic bronchitis
- ☐ Emphysema
- ☐ Chronic obstructive pulmonary disease (COPD)
- ☐ Diabetes
- ☐ Heart disease
- ☐ Cancer
- ☐ Intestinal or stomach ulcers
- ☐ Stroke
- ☐ Urinary incontinence
- ☐ Bowel disorder (Crohn's Disease, ulcerative colitis, Irritable Bowel Syndrome or bowel incontinence)

Are you currently taking any prescribed medications for the chronic condition/s? If so, please list them below.

_____

_____

_____

<u>The following series of questions pertain to your physical, mental and emotional satisfaction as well as any potential sources of stress in your life. Please answer to the best of your abilities using the following scale:</u>

1 = very satisfied; 2 = satisfied; 3 = neither satisfied or dissatisfied; 4 = Dissatisfied; 5 = very dissatisfied

How satisfied are you with yourself?	1	2	3	4	5
How satisfied are you with your leisure activities?	1	2	3	4	5
How satisfied are you with your financial situation?	1	2	3	4	5

How satisfied are you with the way your body looks?	1	2	3	4	5
How satisfied are you with your relationships with other family members?	1	2	3	4	5
How satisfied are you with your relationships with friends?	1	2	3	4	5

Thinking about stress in your day-to-day life, what would you say is the most important thing contributing to feelings of stress you may have? *(Please check all that apply and rank your selection in order from **most** stressful to **least** stressful)*

(Rank)

- ☐ Time pressures / not enough time ____

- ☐ Your physical health problem or condition ____
- ☐ Your emotional or mental health problem or condition ____
- ☐ Financial situation (e.g., not enough money, debt) ____
- ☐ Your work situation (e.g., hours of work, working conditions) ____
- ☐ School ____
- ☐ Employment status (e.g., unemployment) ____
- ☐ Caring for - own children ____
- ☐ Caring for – others ____
- ☐ Other personal or family responsibilities ____
- ☐ Personal relationships ____
- ☐ Discrimination ____
- ☐ Personal and family's safety ____
- ☐ Health of family members ____
- ☐ Other – Specify: _____ ____
- ☐ Nothing

<u>People have different ways of dealing with stress. Thinking about the ways you deal with stress, please indicate how often you do or feel each of the following items using the scale below:</u>

1 = often; 2 = sometimes; 3 = rarely; 4 = never

When stressed, how often do you try to solve the problem?	1	2	3	4
To deal with stress, how often do you talk to others?	1	2	3	4
When dealing with stress, how often do you try to feel better	1	2	3	4

by smoking more cigarettes than usual?

□ I do not smoke

When dealing with stress, how often do you try to feel better by drinking alcohol?	1	2	3	4
When dealing with stress, how often do you try to feel better by using drugs or medication?	1	2	3	4
How often do you jog or do other exercise to deal with stress?	1	2	3	4
To deal with stress, how often do you try to relax by doing something enjoyable?	1	2	3	4
How often do you blame yourself?	1	2	3	4

The next series of questions pertain to feelings of self-esteem. Please answer the following to the best of your abilities using the following scale:

1 = strongly agree; 2 = agree; 3 = neither agree nor disagree; 4 = disagree; 5 = strongly disagree

You feel that you're a person of worth at least equal to others	1	2	3	4	5
You take a positive attitude toward yourself	1	2	3	4	5
All in all, you're inclined to feel you're a failure	1	2	3	4	5
You have little control over the things that happen to you	1	2	3	4	5
You often feel helpless in dealing with problems of life	1	2	3	4	5
What happens to you in the future mostly depends on you	1	2	3	4	5
You can do just about anything you really set your mind to	1	2	3	4	5

The next questions focus on current employment situation and working conditions. If you are currently unemployed please feel free to move on to the next section.

How satisfied are you with your job?

□Very satisfied □Somewhat satisfied □Not too satisfied □Not at all satisfied

Your job allows you freedom to decide how you do your job.

□Strongly agree □Agree □Neither agree nor disagree □Disagree □Strongly disagree

Your job security is good.

□Strongly agree □Agree □Neither agree nor disagree □Disagree □Strongly disagree

Your job requires a lot of physical effort.

□Strongly agree □Agree □Neither agree nor disagree □Disagree □Strongly disagree

You are exposed to hostility or conflict from the people you work with.

□Strongly agree □Agree □Neither agree nor disagree □Disagree □Strongly disagree

The following questions focus on smoking, alcohol and sexual behaviours. Please answer as honestly as possible.

At the present time, how often do you smoke cigarettes daily?

□Daily □Occasionally □Not at all

If you chose **daily, please indicate how many cigarettes you usually smoke per day?*

_____

During the past 12 months, have you had a drink of beer, wine, liquor or any other alcoholic beverage? If yes, please indicate how often you drank these beverages.

- □ Less than once a month
- □ Once a month
- □ 2 to 3 times a month
- □ Once a week
- □ 2 to 3 times a week
- □ 4 to 6 times a week
- □ Every day

How often in the past 12 months have you had 5 or more drinks on one occasion?

- □ Never
- □ Less than once a month
- □ Once a month
- □ 2 to 3 times a month
- □ Once a week
- □ More than once a week

<u>If applicable</u>, please indicate why you reduced or quit drinking altogether? (Select all that apply)

- ☐ Dieting
- ☐ Athletic training
- ☐ Pregnancy
- ☐ Getting older
- ☐ Drinking too much / drinking problem
- ☐ Affected - work, studies, employment opportunities
- ☐ Interfered with family or home life
- ☐ Affected - physical health
- ☐ Affected - friendships or social relationships
- ☐ Affected - financial position
- ☐ Affected - outlook on life, happiness
- ☐ Influence of family or friends
- ☐ Life change
- ☐ Other – Specify

In the past 12 months, have you had sexual intercourse?

- ☐ Yes - If yes, how many times? ☐ Once/week ☐ 2-5 times/week
  ☐ 5-10 times/week ☐>= 10 times/week
- ☐ No

Please answer the following questions using the scale below. During the past month have you…

1 = almost always; 2 = frequently; 3 = Half the time; 4 = rarely; 5 = never

Felt self-confident?	1	2	3	4	5
Felt satisfied with what you were able to accomplish and felt proud of yourself?	1	2	3	4	5
Felt as though you were a "go-getter" and took on lots of projects?	1	2	3	4	5
Felt emotionally balanced?	1	2	3	4	5
Felt loved and appreciated?	1	2	3	4	5
Felt as though you had goals and ambitions?	1	2	3	4	5
Felt like having fun, participating in sports and all your favorite activities and hobbies?	1	2	3	4	5
Been able to clearly sort things out when faced with complicated situations?	1	2	3	4	5
Found life exciting and you wanted to enjoy every moment of it?	1	2	3	4	5
Felt your life has been well-balanced between your family, personal and professional activities?	1	2	3	4	5
Gotten along well with everyone around you?	1	2	3	4	5
Lived at a normal pace, not doing anything excessively?	1	2	3	4	5
Had the impression of really enjoying life?	1	2	3	4	5

Had a good sense of humor, easily making your friends laugh?	1	2	3	4	5
Felt good and at peace with yourself?	1	2	3	4	5
Felt healthy and in good shape?	1	2	3	4	5

People sometimes look to others for companionship, assistance or other types of support. How often are the following kinds of support available to you if you need it?

1 = almost always; 2 = frequently; 3 = Half the time; 4 = rarely; 5 = never

Someone to help you if you were confined to bed:	1	2	3	4	5
Someone you can count on to listen to you when you need to talk:	1	2	3	4	5
Someone to give you advice about a crisis:	1	2	3	4	5
Someone who shows you love and affection:	1	2	3	4	5
Someone to have a good time with:	1	2	3	4	5
Someone to confide in or talk to about yourself or your problems:	1	2	3	4	5
Someone to get together with for relaxation:	1	2	3	4	5
Someone to do things with to help you get your mind off of things:	1	2	3	4	5
Someone to do something enjoyable with:	1	2	3	4	5
Someone who understands your problems:	1	2	3	4	5

The following series of questions pertain to the process and stereotypes of aging. Please answer the following to the best of your abilities.

1= Definitely true; 2 = Somewhat true; 3 = Somewhat false; 4 = Definitely false

When people get older, they need to lower their expectations of how healthy they can be:	1	2	3	4
Having more aches and pains is an accepted part of aging:	1	2	3	4
The human body is like a car: When it gets old, it gets worn out:	1	2	3	4
Every year that people age, their energy levels go down a little more:	1	2	3	4
I expect that as I get older I will spend less time with friends and family:	1	2	3	4
Being lonely is just something that happens when people get old:	1	2	3	4
As people get older they worry more:	1	2	3	4
It's normal to be depressed when you are old:	1	2	3	4
I expect that as I get older I will become more forgetful:	1	2	3	4
It's an accepted part of aging to have trouble remembering names:	1	2	3	4
Forgetfulness is a natural occurrence just from growing old:	1	2	3	4
It is impossible to escape the mental slowness that happens with aging:	1	2	3	4